Initial Observations of Ionospheric Structure and Irregularities Gathered with the VEFI instrument on C/NOFS

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The Vector Electric Field Investigation (VEFI) onboard the C/NOFS spacecraft has returned more than 1500 orbits through the terminator and nightside equatorial regions since its launch in April 2008. C/NOFS is the first satellite with a high duty cycle able to make repeated measurements at all local times at a high repetition rate, and thus provides an invaluable tool to understand the spatial and temporal evolution of ionospheric structure post-sunset. Initial VEFI results reveal that the electric field and plasma density on the nightside, especially post-midnight, are highly structured, even during very quiet intervals. These structures have a significant enhancement in the electric field signature (3 or 4 times the background), and exhibit variability from > 100 km to < 1 m. We discuss how these structured regions compare with typical "Spread-F" signatures, compare their distribution in longitude, local time, and altitude, and present a detailed study of the relations between density and electric field variations for selected events. Finally, we will estimate the effects of this structure on radio wave transmission.